$$x = e^u + u \sin v$$
$$y = e^u - u \cos v$$

$u(\overline{x,y})$ $\qquad \frac{\partial u}{\partial x}(1)$

$v(x,y)$ $\qquad \frac{\partial v}{\partial x}(1)$

$$[x_0, y_0, u_0, v_0] = [e+1, e, 1, \tfrac{\pi}{2}] = 1$$

$$F_1 = e^u + u \sin v - x$$

$(x,y) = \overline{x}$

$(u,v) = \overline{y}$

$$F_2 = e^u - u \cos v - y$$

$$F = (F_1, F_2) \quad F : \mathbb{R}^4 \longrightarrow \mathbb{R}^2$$

$$\mathbb{R}^{2+2} \longrightarrow \mathbb{R}^2$$

$$F \in C^1(\mathbb{R}^4)$$
$$\Downarrow$$
$$G = \mathbb{R}^4$$

$$F_1(1) = e^1 + \cancel{u}\,1 \sin \tfrac{\pi}{2} - (e+1) = 0$$

$$F_2(1) = e^1 - 1 \cos \tfrac{\pi}{2} - e = 0$$

$\frac{\partial F_1}{\partial u}$ $\qquad$ $\frac{\partial F_1}{\partial v}$

$\frac{\partial F_2}{\partial u}$ $\qquad$ $\frac{\partial F_2}{\partial v}$

$$\begin{vmatrix} e^u + \sin v & u\cos v \\ e^u - \cos v & + u\sin v \end{vmatrix}$$

Sostituiamo A

$$\begin{vmatrix} e + 1 & \overbrace{1\cos\frac{\pi}{2}}^{0} \\ e - 0 & 1 \end{vmatrix} =$$

$$= e + 1 \neq 0$$ ☺

$\frac{\partial u}{\partial x}$ $\qquad$ $\frac{\partial \cancel{v}}{\partial x}$:

$u(x,y)$

$x = e^u + \underline{u \cdot \sin v}$

$y = e^u - u\cos v$

(u,v)

$\frac{\partial f}{\partial u} \cdot \frac{\partial u}{\partial x} + \frac{\partial f}{\partial v} \cdot \frac{\partial v}{\partial x}$

∂x: ~ A :)

$$1 = e^u \cdot \frac{\partial u}{\partial x} + \left(1 \cdot \sin v \cdot \frac{\partial u}{\partial x} + u \cdot \cos v \cdot \frac{\partial v}{\partial x}\right)$$

$$0 = e^u \frac{\partial u}{\partial x} - \left(\cos v \frac{\partial u}{\partial x} + u(-\sin v)\frac{\partial v}{\partial x}\right)$$

$$\left[\underset{x}{e+1},\ \underset{y}{e},\ \underset{u}{1},\ \underset{v}{\pi/2}\right]$$

$$1 = e \cdot \frac{\partial u}{\partial x} + \frac{\partial u}{\partial x} + 0$$

$$\boxed{\frac{\partial u}{\partial x}(A) = \frac{1}{1+e}}$$

$$0 = e \frac{\partial u}{\partial x} - \left(0 - 1 \cdot 1 \cdot \frac{\partial v}{\partial x}\right)$$

$$\frac{\partial v}{\partial x}(A) = -e\frac{\partial u}{\partial x}$$

$$\boxed{\frac{\partial v}{\partial x}(A) = \frac{-e}{1+e}}$$